

B3 Figure 4A shows the blockade of the SPIH channels by Cs^+ (control).

Figure 4B shows the blockade of the SPIH channels by 10 mM Cs^+ .

IN THE CLAIMS:

~~Please cancel claims 4-11 and 19-46 as directed to a nonelected invention.~~

~~Please also cancel claims 1 and 2.~~

Please amend the indicated claims to read as follows:

B4 3. An isolated or purified nucleic acid comprising the nucleotide sequence of SEQ ID NO: 1 or a fragment thereof of at least six nucleotides.

B5 12. An isolated or purified nucleic acid characterized in that the sequence thereof is at least 80% identical to the isolated or purified nucleic of SEQ ID NO: 1, 2, 3, 4, 5 or 12.

B6 13. The isolated or purified nucleic acid of claim 12, characterized in that the sequence thereof is at least 90% identical to the isolated or purified nucleic acid of SEQ ID NO 1, 2, 3, 4, 5 or 12.

B7 14. An isolated or purified nucleic acid characterized in that the nucleic acid hybridizes under low stringency conditions with SEQ ID NO: 1, 2, 3, 4, 5 and/or 12, wherein said low stringency conditions include hybridization with 0.1-5 x SSC at 50-60° C.

B8 15. The isolated or purified nucleic acid of claim 14, characterized in that the nucleic acid hybridizes under stringent conditions with SEQ ID NO: 1, 2, 3, 4, 5 and/or 12, wherein said stringent conditions include hybridization with 0.1-5 x SSC at 60-70°C.

16. A vector comprising the isolated or purified nucleic acid of claim 3.

B9 18. A composition comprising the isolated or purified nucleic acid of claim 3 and a carrier therefor.

Patent Claims

1. Nucleic acid, preferably DNA, which codes for an I_h ion channel or part thereof, or nucleic acid complementary thereto.
2. Nucleic acid according to claim 1, **characterized in** that the nucleic acid is of human origin.
3. Nucleic acid according to claim 2, **characterized in** that it comprises the sequence according to SEQ ID NO 1 or parts thereof.
4. Nucleic acid according to claim 1, **characterized in** that the nucleic acid derives from rat.
5. Nucleic acid according to claim 4, **characterized in** that it comprises the sequence according to SEQ ID NO 2 or parts thereof.
6. Nucleic acid according to claim 1, **characterized in** that the nucleic acid is bovine-derived.
7. Nucleic acid according to claim 6, **characterized in** that it comprises a sequence according to SEQ ID NO 3 or SEQ ID NO 12 or parts of said sequences.
8. Nucleic acid according to claim 1, **characterized in** that the nucleic acid derives from sea urchin.
9. Nucleic acid according to claim 8, **characterized in** that it comprises the sequence according to SEQ ID NO 4 or parts thereof.

10. Nucleic acid according to claim 1, **characterized in** that the nucleic acid derives from *Drosophila*.
11. Nucleic acid according to claim 10, **characterized in** that it comprises the sequence according to SEQ ID NO 5 or parts thereof.
12. Nucleic acid, preferably DNA, **characterized in** that the sequence thereof exhibits a homology of at least 80% to a nucleic acid according to one of claims 1 to 11.
13. Nucleic acid according to claim 12, **characterized in** that the homology is at least 90%.
14. Nucleic acid, preferably DNA, **characterized in** that it hybridizes under low stringency with SEQ ID NO 1, 2, 3, 4, 5 and/or 12.
15. Nucleic acid according to claim 14, **characterized in** that it hybridizes under stringent conditions with SEQ ID NO 1, 2, 3, 4, 5 and/or 12.
16. Nucleic acid according to one of claims 1 to 15, **characterized in** that it is a RNA.
17. Polypeptide encoded by a nucleic acid according to one of claims 1 to 16.
18. Use of a nucleic acid according to one of claims 1 to 16 and/or a polypeptide according to claim 17 for identifying substances which influence the activity of the ion channel.

19. Use of a nucleic acid according to one of claims 1 to 16 and/or of a polypeptide according to claim 17 in treating and/or diagnosing ion channel-associated diseases.

20. Method for identifying substances with effect on ion channels, comprising the step of contacting the substance to be tested with a nucleic acid molecule according to one of claims 1 to 16 and/or a polypeptide according to claim 17.

21. Method according to claim 20, comprising the following steps:

- producing homogeneous channel preparations with the help of the nucleic acid molecules according to one of claims 1 to 16 and/or the polypeptide according to claim 17, and
- testing substances on said channel preparation.

22. Kit for carrying out a method according to claim 20 and/or 21, comprising at least one nucleic acid according to one or several of claims 1 to 16 and/or a polypeptide according to claim 17.

23. Method for detecting a cardiovascular disorder, **characterized in** that a nucleic acid according to one of claims 1 to 16 and/or a polypeptide according to claim 17 is contacted with material from a patient.

24. Method according to claim 23, comprising the following step:

- contacting the nucleic acid from the patient with a nucleic acid according to one of claims 1 to 16, whereby a signal is obtained that is indicative of the presence and/or absence of an ion channel sequence.

25. Use of one or more nucleic acids according to one of claims 1 to 16 and/or of the polypeptide according to claim 17 for the treatment and/or prophylaxis of

cardiovascular disorders, disturbances of consciousness and/or pain states.

26. Use according to claim 25, **characterized in** that the cardiovascular disorders are due to a faulty control of the sinus node.

27. Use according to claim 25, **characterized in** that the disturbances of consciousness are due to a faulty function in thalamic neurons.

28. Pharmaceutical composition comprising one or more of the nucleic acids according to one of claims 1 to 16 and/or the polypeptide according to claim 17.

29. Construct containing a nucleic acid according to one of claims 1 to 16.

30. Host cell containing a construct according to claim 29.

31. Antibody reacting with a polypeptide according to claim 17.

32. Nucleic acid sample which is specific for a nucleic acid according to SEQ ID NO 1, 2, 3, 4, 5 and/or 12.